CLAIM AMENDMENTS

Claim 1 (Currently Amended):

A method of validating the flow calibration factor for ~~of a Coriolis flowmeter adapted to process~~ a material flow~~,; said method~~ comprising the steps of:

defining at least one ~~a reference~~ density at a reference temperature of said material flow;

~~measuring~~ determining a compensated line density and a line temperature of said material flow, wherein the step of determining the compensated line density includes temperature compensating a line density by determining the line density ~~said line density~~ when said line temperature corresponds to said reference temperature; and

detecting an error condition, wherein the step of detecting an error condition includes comparing said ~~reference density to said line density when said line temperature corresponds to said reference temeprature~~ compensated line density to the at least one density.

Claim 2 (Currently Amended):

The method of claim 1 ~~wherein said step of measuring comprises the further steps of:~~

wherein said at least one density includes ~~defining~~ upper and lower limits ~~of values~~ for said compensated line density. ~~of said temperature compensated reference density;~~

~~determining whether each generated temperature compensated reference density is within said limits; and~~

~~continuing said measurement when said temperature compensated reference density is within said limits.~~

Claim 3 (Cancelled):

Claim 4 (Currently Amended):

The method of claim 2 wherein said upper and lower limits are determined by determining a reference density for said material flow at said reference temperature and selecting said upper and lower limits so that the reference density is between said upper and lower limits.~~reference temperature is between the limits of variations of said line temperature.~~

Claim 5 (Currently Amended):

The method of claim 1 wherein said at least one density is a reference density for said material flow that is determined at the reference temperature. ~~2 characterised in that said method further comprises the step of generating an error signal upon the detection of a temperature compensated reference density exceeding said limits.~~

Claim 6 (Currently Amended):

The method of claim 1 characterised in that said method further comprises the steps of:

~~successively measure~~ measuring the line pressure of said material flow;

determining a ~~density/~~pressure compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density ~~temperature compensated reference density~~ using said ~~density/~~pressure compensation factor. ~~to derive a pressure and temperature compensated. reference density; and~~

~~using said pressure and temperature compensated line reference density in determining said flow calibration factor of said Coriolis flowmeter.~~

Claim 7 (Currently Amended):

The method of claim 6 wherein said ~~density/~~pressure compensation factor is formed by the steps of:

determining the ratio of changes in density to changes in pressure;

determining a ~~in the~~ pressure difference between said line pressure and a ~~said~~ reference pressure; and

multiplying said ratio by said pressure difference to obtain said pressure compensation factor.

Claim 8 (Currently Amended):

~~The method of claim 2 wherein said limits further define upper and lower limits for variations in said pressure and temperature compensated reference density.~~The method of claim 6 characterised in that said method further comprises the steps of:

measuring the material composition of said material flow;

determining a material composition compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature and pressure compensated line density using said material composition compensation factor.

Claim 9 (Currently Amended):

The method of claim 1 characterised in that said method further comprises the steps of:

~~successively~~ measuring the material composition of said material flow;

determining a material composition compensation factor for ~~the density of~~ said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density ~~said temperature compensated reference density~~ using said material composition compensation factor. ~~to derive a material composition and pressure and temperature compensated reference density; and~~

~~using material composition and said pressure and said temperature compensated reference density in validating said flow calibration factor of said Coriolis flowmeter.~~

Claim 10 (Currently Amended):

~~The method of any of claim 9 wherein said limits further define upper and lower limits for variations in said material composition and said pressure and temperature compensated reference density.~~

The method of claim 9 characterised in that said method further comprises the steps of:

measuring the line pressure of said material flow;

determining a pressure compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said material composition and temperature compensated line density using said pressure compensation factor.

Claims 11-13 (Cancelled)

Claim 14 (Currently Amended):

A computer program product comprising computer usable medium including executable code for executing a process comprising the steps of:~~A software product adapted to calibrate a Coriolis flowmeter, said soft product comprising:~~

~~a media configured to store instructions;~~

~~a processing system configured to read said instructions from said media;~~

~~said instructions configured to direct said processing system to execute the steps of:~~

defining at least one density at a reference temperature of a material flow ~~processed by said Coriolis flowmeter~~;

~~successively measuring the~~ determining a compensated line density and line temperature of said material flow, wherein the step of determining the compensated line density includes temperature compensating a line density by determining the line density when said line temperature corresponds to said reference temperature; and

detecting an error condition, wherein the step of detecting an error condition includes comparing said compensated line density to the at least one density.

~~generating a compensated density for said reference temperature in response to each measurement; and~~

~~validating a flow calibration factor of said Coriolis flowmeter using said generated temperature compensated reference density.~~

Claim 15-16 (Cancelled):

Claim 17 (New):

The computer program product according to claim 14 wherein said at least one density includes upper and lower limits for said compensated line density.

Claim 18 (New):

The computer program product according to claim 17 wherein said upper and lower limits are determined by determining a reference density for said material flow at said reference temperature and selecting said upper and lower limits so that the reference density is between said upper and lower limits.

Claim 19 (New):

The computer program product according to claim 14 wherein said at least one density is a reference density for said material flow that is determined at the reference temperature.

Claim 20 (Currently Amended):

The computer program product according to claim 14 characterised in that said method further comprises the steps of:

measuring the line pressure of said material flow;

determining a pressure compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density using said pressure compensation factor.

Claim 21 (New):

The computer program product according to claim 20 wherein said pressure compensation factor is formed by the steps of:

determining the ratio of changes in density to changes in pressure;

determining a pressure difference between said line pressure and a reference pressure; and

multiplying said ratio by said pressure difference to obtain said pressure compensation factor.

Claim 22 (New):

The computer program product according to claim 20 characterised in that said method further comprises the steps of:

measuring the material composition of said material flow;

determining a material composition compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature and pressure compensated line density using said material composition compensation factor.

Claim 23 (New):

The computer program product according to claim 14 characterised in that said method further comprises the steps of:

measuring the material composition of said material flow;

determining a material composition compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density said material composition compensation factor.

Claim 24 (New):

The computer program product according to claim 23 characterised in that said method further comprises the steps of:

measuring the line pressure of said material flow;

determining a pressure compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said material composition and temperature compensated line density using said pressure compensation factor to derive the compensated line density that has been compensated for material composition, pressure, and temperature.

Claim 25 (New):

A method of validating the flow calibration factor of a material flow, comprising the steps of:

defining at least one density at a reference temperature of said material flow;

determining a compensated line density and a line temperature of said material flow, wherein the step of determining the compensated line density includes temperature compensating a line density by determining the line density when said line temperature and said reference temperature differ and compensating the determined line density for the difference between the line temperature and the reference temperature; and

detecting an error condition, wherein the step of detecting an error condition includes comparing said compensated line density to the at least one density.

Claim 26 (New):

The method of claim 25 wherein said at least one density includes upper and lower limits for said compensated line density.

Claim 27 (New):

The method of claim 26 wherein said upper and lower limits are determined by determining a reference density for said material flow at said reference temperature and selecting said upper and lower limits so that the reference density is between said upper and lower limits.

Claim 28 (New):

The method of claim 25 wherein said at least one density is a reference density for said material flow that is determined at the reference temperature.

Claim 29 (New):

The method of claim 25 characterised in that said method further comprises the steps of:

measuring the line pressure of said material flow;
determining a pressure compensation factor for said material flow; and
wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density using said pressure compensation factor.

Claim 30 (New):

The method of claim 29 wherein said pressure compensation factor is formed by the steps of:

determining the ratio of changes in density to changes in pressure;
determining a pressure difference between said line pressure and a reference pressure; and
multiplying said ratio by said pressure difference to obtain said pressure compensation factor.

Claim 31 (New):

The method of claim 29 characterised in that said method further comprises the steps of:

measuring the material composition of said material flow;

determining a material composition compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature and pressure compensated line density using said material composition compensation factor.

Claim 32 (New):

The method of claim 25 characterised in that said method further comprises the steps of:

measuring the material composition of said material flow;

determining a material composition compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density using said material composition compensation factor.

Claim 33 (New):

The method of claim 32 characterised in that said method further comprises the steps of:

measuring the line pressure of said material flow;

determining a pressure compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said material composition and temperature compensated line density using said pressure compensation factor.

Claim 34 (New):

The method of claim 25 further comprising the steps of:

providing a data structure including information relating density values and a range of temperatures; and

where the step of determining the compensated line density includes applying the line density determined when said line temperature and said reference temperature differ to said data structure.

Claim 35 (New):

The method of claim 25 further comprising the steps of:

providing a data structure including information relating material pressure values, density values, and a range of temperatures;

determining a line pressure of the material flow; and

where the step of determining the compensated line density includes applying the line density determined when said line temperature and said reference temperature differ, said determined line temperature, and said determined line pressure to said data structure.

Claim 36 (New):

The method of claim 25 further comprising the steps of:

providing a data structure including information relating material composition, density values, and a range of temperatures;

determining the material composition of the material flow; and

where the step of determining the compensated line density includes applying the line density determined when said line temperature and said reference temperature differ, said determined line temperature, and said determined material composition to said data structure.

Claim 37 (New):

A computer program product comprising computer usable medium including executable code for executing a process comprising the steps of:

defining at least one density at a reference temperature of a material flow;

determining a compensated line density and line temperature of said material flow, wherein the step of determining the compensated line density includes temperature compensating a line density by determining the line density when said line temperature and said reference temperature differ and compensating the determined line density for the difference between the line temperature and the reference temperature; and

detecting an error condition, wherein the step of detecting an error condition includes comparing said compensated line density to the at least one density.

Claim 38 (New):

The computer program product according to claim 37 wherein said at least one density includes upper and lower limits for said compensated line density

Claim 39 (New):

The computer program product according to claim 38 wherein said upper and lower limits of values for said compensated line density are determined by determining a reference density for said material flow at said reference temperature and selecting said upper and lower limits so that the reference density is between said upper and lower limits.

Claim 40 (New):

The computer program product according to claim 37 wherein said at least one density is a reference density for said material flow that is determined at the reference temperature.

Claim 41 (New):

The computer program product according to claim 37 characterised in that said method further comprises the steps of:

measuring the line pressure of said material flow;

determining a pressure compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density using said pressure compensation factor.

Claim 42 (New):

The computer program product according to claim 41 wherein said pressure compensation factor is formed by the steps of:

determining the ratio of changes in density to changes in pressure;

determining a pressure difference between said line pressure and a reference pressure; and

multiplying said ratio by said pressure difference to obtain said pressure compensation factor.

Claim 43 (New):

The computer program product according to claim 41 characterised in that said method further comprises the steps of:

measuring the material composition of said material flow;

determining a material composition compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature and pressure compensated line density using said material composition compensation factor.

Claim 44 (New):

The computer program product according to claim 37 characterised in that said method further comprises the steps of:

measuring the material composition of said material flow;

determining a material composition compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said temperature compensated line density said material composition compensation factor.

Claim 45 (New):

The computer program product according to claim 44 characterised in that said method further comprises the steps of:

measuring the line pressure of said material flow;

determining a pressure compensation factor for said material flow; and

wherein the step of determining the compensated line density includes the step of compensating said material composition and temperature compensated line density using said pressure compensation factor to derive the compensated line density that has been compensated for material composition, pressure, and temperature.

Claim 46 (New):

The computer program product according to claim 37 characterised in that said method further comprises the steps of:

providing a data structure including information relating density values and a range of temperatures; and

where the step of determining the compensated line density includes applying the line density determined when said line temperature and said reference temperature differ to said data structure.

Claim 47 (New):

The computer program product according to claim 37 characterised in that said method further comprises the steps of:

providing a data structure including information relating material pressure values, density values, and a range of temperatures;

determining a line pressure of the material flow; and

where the step of determining the compensated line density includes applying the line density determined when said line temperature and said reference temperature differ, said determined line temperature, and said determined line pressure to said data structure.

Claim 48 (New):

The computer program product according to claim 37 characterised in that said method further comprises the steps of:

providing a data structure including information relating material composition, density values, and a range of temperatures;

determining the material composition of the material flow; and

where the step of determining the compensated line density includes applying the line density determined when said line temperature and said reference temperature differ, said determined line temperature, and said determined material composition to said data structure.